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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/833,036	04/11/2001	Alfred M. Gabriele	02208-1	8351

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EXAMINER

VERSTEEG, STEVEN H

ART UNIT	PAPER NUMBER
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1753

DATE MAILED: 08/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/833,036

Applicant(s)

GABRIELE ET AL.

Examiner

Steven H VerSteeg

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 07 July 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,4-15 and 25-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1,4-14 and 25-33 is/are allowed.
- 6) ☒ Claim(s) 15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 April 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 18.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,334,942 B1 to Haba et al. (Haba) in view of US 5,981,079 to Mount, III et al. (Mount).

3. For claim 15, Applicant requires a method comprising forming a polymeric coating from an electrophoretically applied polymeric precursor and applying a layer of metal over the polymeric coating using a PVD process.

4. Haba discloses a process (col. 5, l. 11) comprising providing a substrate (20), electrophoretically applying a photoresist (24) and polymerizing it (col. 5, l. 27-42), and depositing a metal layer (28) thereon. The metal layer is deposited by electroplating (col. 5, l. 43-44). The metal layer can be gold, osmium, rhodium, platinum, tin, nickel, chromium, and their alloys (col. 5, l. 45-49).

5. Haba does not disclose PVD depositing the metal layer.

6. Mount discloses that for deposition of aluminum, copper, silver, gold, and chromium, sputtering (which is under vacuum) and electroplating are equivalents (col. 5, l. 15-22).

7. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Haba to deposit the metal layer by sputtering because of the

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knowledge that sputtering and electroplating are equivalents for depositing metals such as gold, copper, and chromium.

8. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,004,672 to D'Ottavio et al. (D'Ottavio) in view of US 5,981,079 to Mount, III et al. (Mount).

9. Claim 15 is described above. D'Ottavio discloses providing a substrate, electrophoretically depositing a polymer precursor, polymerizing the precursor, and depositing a copper layer thereon by electroplating (Example 1). After the polymer layer is polymerized, the layer is heated to 200°F for about 5 minutes.

10. D'Ottavio utilizes electroplating to deposit the copper metal layer. Mount is also described above and provides the motivation to utilize sputtering rather than electroplating.

11. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of D'Ottavio to deposit the metal layer by sputtering because of the knowledge that sputtering and electroplating are equivalents for depositing metals such as gold, copper, and chromium.

12. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,007,349 to Distefano.

13. Claim 15 is described above. Distefano discloses electrophoretically depositing a photoresist and then depositing a metal layer over the photoresist layer within the removed photoresist material (col. 6, l. 23-66). The metal layer exemplified to be deposited by electroplating, but there are several other metals that could alternately be used such as nickel, copper, gold, titanium, nickel-titanium alloys, and similar super-plastic alloys (col. 7, l. 1-6).

The heading for the section is "Plating/Sputtering" which suggests that the metal layer could be

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deposited by sputtering or plating. To further show that the metal layer can be deposited by sputtering, Distefano states that one "preferred metal to be used in an embodiment where sputtering is used to deposit a super-plastic metal material such as nickel-titanium alloy" (col. 9, l. 57-59).

14. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Distefano to deposit the metal layer by sputtering over the electrophoretically applied photoresist because Distefano suggests sputtering as an option for depositing the metal layer.

***Response to Amendment***

15. The 103(a) rejection of claim 1 over Haba in view of Mount presented in the office action mailed March 13, 2003 is withdrawn in light of the amendment to add the limitations of former claim 3 into claim 1, but the rejection of claim 15 stands.

16. The 103(a) rejection of claims 1 and 4 over D'Ottavio in view of Mount presented in the office action mailed March 13, 2003 is withdrawn in light of the amendment to add the limitations of former claim 3 into claim 1, but the rejection of claim 15 stands.

17. The double patenting objection to claims 5 and 6 presented in the office action mailed March 13, 2003 is withdrawn in light of the amendment to claim 1.

***Allowable Subject Matter***

18. Claims 1, 4-14, and 25-33 are allowed.

***Response to Arguments***

19. Applicant's arguments filed July 7, 2004 have been fully considered but they are not persuasive.

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20. Applicant has argued that sputtering is not equivalent to electroplating onto a resist. Specifically, Applicant cites from an internet web page that states that "...the plasma used for sputtering...crosslinks the photoresist while the nickel is being deposited...makes it difficult to get the photoresist off the surface..." (pg. 8 of the response filed July 7, 2004). Based upon the quotation, Applicant reasons that sputtering would make it "difficult or impossible" (pg. 8 of the response filed July 7, 2004) to remove the photoresist. Applicant then argues that the sidewalls would be coated with metal and impede penetration of resist by solvents that are used for dissolution and removal of the resist.

21. I must disagree. You have not claimed any removal of the photoresist in claim 15. Also, the cited reference shows that it is "difficult" to remove the photoresist. It does not say that it is "impossible" as you now argue. Haba coats the sidewalls of the resist by electroplating and then is able to remove it with an etching bath (see col. 6). I fail to see how it would be possible to easily remove the resist in an etching bath after electroplating but yet be impossible to remove it after sputtering a metal into the removed photoresist holes. Nonetheless, Distefano, which is cited above and used in a separate rejection, clearly shows that electroplating or sputtering may be used to deposit the metal layer on the electrophoretically deposited photoresist layer. Distefano is further evidence that electroplating and sputtering are interchangeable deposition methods.

### ***General Information***

For general status inquiries on applications not having received a first action on the merits, please contact the Technology Center 1700 receptionist at (571) 272-1700.

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For inquiries involving Recovery of lost papers & cases, sending out missing papers, resetting shortened statutory periods, or for restarting the shortened statutory period for response, please contact Denis Boyd at (571) 272-0992.


For general inquiries such as fees, hours of operation, and employee location, please contact the Technology Center 1700 receptionist at (571) 272-1300.

*Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven H VerSteeg whose telephone number is (571) 272-1348. The examiner can normally be reached on Mon - Thurs (6:30 AM - 5:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Steven H VerSteeg  
Primary Examiner  
Art Unit 1753

shv  
August 2, 2004